

STAFF SUMMARY SHEET

	TO	ACTION	SIGNATURE (Surname), GRADE AND DATE		TO	ACTION	SIGNATURE (Surname), GRADE AND DATE
1	90 MW/ SE	Coord	<i>[Signature]</i> 16 Apr 2012	6	90 MW/ CCS	Coord	<i>[Signature]</i> 17 Apr
2	90 MW/ JA	Coord	<i>[Signature]</i> 11 Apr 12	7	90 MW/ CV	Coord	<i>[Signature]</i> 17 Apr
3	90 MSG/ CC	Coord	<i>[Signature]</i> C of G 13 Apr 12	8	90 MW/ CC	Sign	<i>[Signature]</i> Ca 21 Apr 12
4	90 MW/ CCEA	Coord	<i>[Signature]</i> Maldonado #137 16 Apr 12	9	90 CES/ CC	File	<i>[Signature]</i> 23 Apr 12
5	90 MW/ CCE	Coord	<i>[Signature]</i> 17 Apr	10			

SURNAME OF ACTION OFFICER AND GRADE	SYMBOL	PHONE	TYPIST'S INITIALS	SUSPENSE DATE
Beckwith, GS-11	90 CES/CEAN	773-3667	rh	

SUBJECT	DATE
Final Environmental Assessment, Prescribed Burning for Weed Management	20120405

SUMMARY

1. PURPOSE: 90 MW/CC sign the Final Finding of No Significant Impact (FONSI) allowing the Prescribed Burning action.
2. SUMMARY: F. E. Warren AFB (FEW) is proposing to conduct prescribed burns for weed management located at the Base Lakes and the Fire Training Area, Bldg 1340. Per the requirements of the National Environmental Policy Act (NEPA), an Environmental Assessment (EA) has been developed to analyze potential environmental impacts associated with the proposed prescribed burns. The NEPA process did not reveal any significant impacts to the human or natural environment; therefore, a FONSI has been prepared by and contracted to Booz Allen Hamilton. The FONSI is the decision document that will finalize the NEPA process for the proposed action. Per the requirements of NEPA, the EA was released for public comment from 26 March through 02 April 2012. A public notice was published in the Warren Sentinel to notify the public of the availability of the EA for review. Copies of the EA were placed at the Base Library and on the FEW website. No comments were received.
3. The Final FONSI is located at Tab 1. The Final EA is located at Tab 2.
4. RECOMMENDATION: 90 MW/CC sign the Final FONSI at Tab 1.

for *[Signature]*
 TRAVIS K. LEIGHTON, Lt Col, USAF
 Commander, 90th Civil Engineer Squadron

2 Tabs:

1. Final FONSI, Prescribed Burning for Weed Management
2. Final EA, Prescribed Burning for Weed Management

Report Documentation Page			Form Approved OMB No. 0704-0188		
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1. REPORT DATE APR 2012		2. REPORT TYPE		3. DATES COVERED 00-00-2012 to 00-00-2012	
4. TITLE AND SUBTITLE Final Environmental Assessment Prescribed Burning for Weed Management on F. E. Warren Air Force Base, Wyoming			5a. CONTRACT NUMBER		
			5b. GRANT NUMBER		
			5c. PROGRAM ELEMENT NUMBER		
6. AUTHOR(S)			5d. PROJECT NUMBER		
			5e. TASK NUMBER		
			5f. WORK UNIT NUMBER		
7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES) Booz Allen Hamilton,8283 Greensboro Drive,McLean,VA,22102			8. PERFORMING ORGANIZATION REPORT NUMBER		
9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES)			10. SPONSOR/MONITOR'S ACRONYM(S)		
			11. SPONSOR/MONITOR'S REPORT NUMBER(S)		
12. DISTRIBUTION/AVAILABILITY STATEMENT Approved for public release; distribution unlimited					
13. SUPPLEMENTARY NOTES					
14. ABSTRACT					
15. SUBJECT TERMS					
16. SECURITY CLASSIFICATION OF:			17. LIMITATION OF ABSTRACT Same as Report (SAR)	18. NUMBER OF PAGES 21	19a. NAME OF RESPONSIBLE PERSON
a. REPORT unclassified	b. ABSTRACT unclassified	c. THIS PAGE unclassified			

FINAL

FINDING OF NO SIGNIFICANT IMPACT

Prescribed Burning for Weed Management

F. E. Warren Air Force Base, Wyoming

DECISION

It is my decision to approve the Proposed Action as described in the Environmental Assessment (EA), which is attached and incorporated by reference. F. E. Warren Air Force Base will conduct Prescribed Burns on base. These burns will take place in the area immediately surrounding North Pearson Lake near Gate 5 off Central Avenue and in the Fire Department Training Area immediately surrounding the Fire Training Tower, Building 1340.

FINDING OF NO SIGNIFICANT IMPACT

The EA was prepared and evaluated pursuant to the National Environmental Policy Act (Public Law 91-190, 42 U.S.C. 4321 *et seq*) and 32 CFR 989. I have concluded that the Proposed Action does not constitute a "major federal action significantly affecting the quality of the human environment" when considered individually or cumulatively in the context of the referenced Act, including both direct and indirect impacts. Therefore, an Environmental Impact Statement is not necessary.

RATIONALE FOR DECISION

My decision to approve the proposed action, to conduct Prescribed Burns on F. E. Warren Air Force Base is based upon the following:

Prescribed burning at North Pearson Lake and the Fire Training Area will help to control brush and noxious weeds.

APPROVED BY


CHRISTOPHER A. COFFELT, Colonel, USAF
Commander, 90th Missile Wing

21 APR 12
DATE

FINAL

ENVIRONMENTAL ASSESSMENT

PRESCRIBED BURNING FOR WEED MANAGEMENT

ON

F. E. WARREN AIR FORCE BASE, WYOMING

April 2012

Prepared by:
BOOZ ALLEN HAMILTON
90 CES/CEAN, Francis E. Warren AFB, Wyoming
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1.0 PURPOSE AND NEED FOR ACTION

Present day research and experience have shown that prescribed burning can be an effective land management tool. Prescribed burns are used most frequently to maintain and restore native grasslands. Prescribed burning can recycle nutrients tied up in old plant growth, control many woody plants and herbaceous weeds, improve poor quality forage, increase plant growth, and improve certain wildlife habitat.

Phase I of the proposed action is to conduct a prescribed burn on approximately 43 acres surrounding North Pearson Lake on F. E. Warren Air Force Base (see Appendix A, Figure A.1). Following the prescribed burn, native grass seed would be broadcast throughout the burned area to promote the growth of native prairie grasses and establish competition for invasive species (especially Canada thistle).

Phase II of the proposed action is a prescribed burn that would be conducted on approximately 20 acres surrounding the Fire Department Tower Building, Building No. 1340 (see Appendix A, Figure A.2). The Phase II prescribed burn would be used to eliminate tall weeds and debris around the Fire Tower building in the Fire Department's training site. This would create an improved environment for Fire Department's training exercises.

1.1. Scope of the Environmental Assessment

This Environmental Assessment (EA) is required by the Air Force Environmental Impact Analysis Process (32 CFR 989), the National Environmental Policy Act (Public Law 91-190), and Council on Environmental Quality (CEQ) Regulations (40 CFR Parts 1500-1508). This EA identifies, describes, and evaluates the potential direct, indirect, and cumulative environmental impacts that could result from the proposed action.

2.0 ALTERNATIVES INCLUDING THE PROPOSED ACTION

2.1. Alternative 1 – Conduct Prescribed Burns (Proposed Action)

Phase I of the proposed action is to conduct a prescribed burn on approximately 43 acres surrounding North Pearson Lake on F. E. Warren Air Force Base (see Appendix A, Figure A.1). Following the prescribed burn, native grass seed would be broadcast throughout the burned area to promote the growth of native prairie grasses and establish competition for invasive species (especially Canada Thistle). Areas within 500 feet of the guard shack at Gate 5 (Central Avenue) would be burned after 0600 or before 1800.

Phase II of the proposed action is a prescribed burn that would be conducted on approximately 20 acres surrounding the Fire Department Burn Tower Building, Building No. 1340. This prescribed burn would be used to eliminate tall weeds and debris around the Tower building in the Fire Department's training site. This would create an improved environment for Fire Department's training exercises. Because this burn

would not occur in a heavily trafficked area, burning would take place between 1200-1500; on a weekday. The prescribed burns are planned to be conducted on 15 May 2012; procedure involves using kerosene infused drip torches to facilitate the burn.

2.2. Alternative 2 – Do Not Conduct Prescribed Burns (No Action)

Alternative 2 would be to take no action; neither prescribed burn would take place. This alternative does not meet the purpose and need specified in Section 1.0.

3.0 ENVIRONMENTAL CONSEQUENCES

3.1. Alternative 1 – Conduct Prescribed Burns (Proposed Action)

Under Alternative 1, there are no anticipated impacts to land use, meteorology, wetlands, threatened and endangered species, cultural and archeological resources, noise, hazardous materials, hazardous waste, solid waste, environmental justice, or socioeconomic conditions.

3.1.1. Soils

Direct and Indirect Impacts – Fire can affect soil characteristics, erosion rates, patterns of vegetation, and nutrient availability. Extreme fire temperatures, as experienced during some severe wildfire situations, can cause volatilization of essential nutrients like nitrogen and impact soil productivity by creating bare soil and/or hydrophobic conditions. However, nutrients are also made available by fire, primarily by converting old plant growth into more easily decomposed materials. The prescribed burn would not be expected to result in a severe fire that would negatively impact the physical and chemical properties of the soils. The resulting moderately burned organics with partially consumed, shallow ash layers should stimulate vigorous regrowth of vegetation during succeeding summers. Under the proposed action, only minor amounts of soil erosion would result, and overall impacts to soils would be insignificant.

Cumulative Impacts – When combined with the impacts of other projects on or proximate to the base, this alternative would not significantly impact soils.

3.1.2. Air Quality

Direct and Indirect Impacts – Prescribed burning produces smoke, which is a mixture of toxic particles and gases. If not carefully managed, smoke can be a nuisance to residents and businesses, and it can adversely impact community health. However, to minimize smoke impacts and protect public health, burning would be conducted under appropriate atmospheric conditions. Additionally, the prescribed burn would be conducted only during the day because nighttime temperature inversions can hold and spread smoke along the ground. Smoke particles may settle with cool air at night and create a trace of haze the morning

after the prescribed burn, which would lift as the day warms. F. E. Warren AFB and Laramie County are in attainment for all criteria air pollutants; however, the prescribed burn would require notification to the Wyoming Department of Environmental Quality (WDEQ) Air Quality Division. The F.E. Warren Fire Department is responsible for obtaining all air quality permits necessary to conduct the burn. Under the proposed action, impacts to air quality would be insignificant.

Cumulative Impacts – Gate 5 is in the immediate vicinity of the proposed burn area for Phase I. The combination of vehicle emissions and smoke would create an increase in airborne particulate matter in the prescribed burn area; however, this impact would be temporary in nature, lasting two days or less. The only road near prescribed burn area for the Phase II burn leads to the FAM Camp recreation area. This road does not handle significant amounts of traffic except during the summer months (June-September). When combined with the impacts of other projects on or proximate to the base, this alternative would not significantly impact air quality.

3.1.3. Water Resources

Direct and Indirect Impacts – Fires affect water quality and water cycle processes to a greater or lesser extent depending on fire severity. When a fire occurs, changes in water quality are primarily the result of soil erosion and deposition of soil materials into water. Fires may cause suspended sediment, elevated temperatures, increased pH values, and changed chemical concentrations and aquatic organism populations. Fire can also have positive effects on water resources. For example, the increased nutrient flow into streams and lakes can rejuvenate fish populations. The effects of low severity fires on water resources are generally minimal and short-lived. Under the proposed action, impacts to water resources would be insignificant.

Cumulative Impacts – When combined with the impacts of other projects on or proximate to the base, this alternative would not significantly impact water resources.

3.1.4. Plant Communities

Direct and Indirect Impacts – An obvious, immediate effect of fire on vegetation is plant mortality. Plant species exhibit a variety of traits and mechanisms by which they are able to survive and recover from fire. These traits and mechanisms are common to species found in nearly all terrestrial North American ecosystems. Fire can promote plant species that are well adapted to fire and suppress plant species that are poorly adapted to fire. As a result, fire can cause dramatic and immediate changes in species composition and diversity. Fire (along with insects and pathogens) is responsible for the decomposition of dead organic matter and the recycling of nutrients. Without fire, plant debris can accumulate and nutrients become tied up in dead vegetation. Plant debris accumulation can suppress living vegetation, increase likelihood of plant mortality from insects and disease, and lead

to higher intensity fires. Under the proposed action, impacts to plant communities would be insignificant.

Cumulative Impacts – When combined with the impacts of other projects on or proximate to the base, this alternative would not significantly impact plant communities.

3.1.4.1. Noxious Weeds

Exposed ground surfaces, a flush of nutrients, and high light/low shade may favor regrowth and expansion of invasive plants in burned areas. Because of their early germination and rapid growth rates, some invasive plants may quickly capture newly available resources. The proposed action may increase invasive plants in the project area; however, the re-establishment of native grasses would provide competition to reduce or eliminate noxious weeds over time. Under the proposed action, it is anticipated that the impact on native plants will be beneficial because of the elimination of noxious weeds.

3.1.5. Fish and Wildlife

Direct and Indirect Impacts – The habitat changes caused by fire influence animal populations and communities much more profoundly than fire itself. Long-term faunal response to fire is determined by habitat change, which influences feeding, movement, reproduction, and availability of shelter. The immediate and short-term effects of fire on terrestrial birds and mammals include injury, mortality, emigration, and immigration. Fires generally kill and injure a relatively small proportion of animal populations because many vertebrate species flee or seek refuge during fires. Animals with limited mobility living above ground are the most vulnerable to fire-caused injury and mortality, but occasionally even large mammals are killed by fire. Nestlings and juveniles of birds and small mammals are also vulnerable to fire-caused mortality. While non-burrowing mammals and most birds leave their habitat while it is burning, many return within hours or days. Others emigrate because the food and cover they require are not available within the burned area. The length of time before these species return depends on how much a fire has altered their habitat structure and food supply. The effects of fire on fish and aquatic macroinvertebrates are mostly indirect in nature. Fire typically improves habitat conditions for aquatic species over the long-term. The proposed prescribed burn is expected to be of low severity; therefore, impacts to fish and wildlife would be insignificant.

Cumulative Impacts – When combined with the impacts of other projects on or proximate to the base, this alternative would not significantly impact fish and wildlife.

3.1.6. Health and Safety

Direct and Indirect Impacts – The safety of the people involved with the prescribed burn would be the highest priority. Safety has been promoted through training, removal of hazards, and through provisions for personal protective equipment and devices. The procedure, equipment, and number of trained personnel would be adequate to accomplish the intended purposes. Fuel loads in the proposed burn area are not significant (i.e., shortgrass prairie). There are no utilities in the proposed burn area that present a hazard. Oversight and implementation of the proposed burn would be conducted by personnel from the Bureau of Land Management, the F. E. Warren AFB Fire Department, and the F. E. Warren AFB Environmental Office. Controlled burn standards for prescribed burns would be implemented to protect workers. The F.E. Warren Fire Department is responsible for obtaining all permits related to occupational health and safety. Under the proposed action, impacts to health and safety are expected to be insignificant.

Cumulative Impacts – When combined with the impacts of other projects on or proximate to the base, this alternative would not significantly impact health and safety.

3.1.7. Utilities

Direct and Indirect Impacts – There are no electric power lines or natural gas pipelines in either proposed burn area. A water line exists in the Phase I proposed burn area, but it would not be impacted by a surface burn. Above-ground structures in the proposed burn area have been identified and would be avoided in order to prevent damage. Under the proposed action, impacts to utilities are expected to be insignificant.

Cumulative Impacts – When combined with the impacts of other projects on or proximate to the base, this alternative would not significantly impact utilities.

3.1.8. Transportation

Direct and Indirect Impacts – Phase I and Phase II of the burn would be conducted only during the day because nighttime temperature inversions can hold and spread smoke along the ground. Visibility is usually impaired in smoke, creating a traffic hazard. Personnel would be posted along Rogers Drive from Gate 5 to Wapiti Road to ensure proper traffic flow during Phase I of the burn. Under the proposed action, impacts to transportation are expected to be insignificant.

Cumulative Impacts – When combined with the impacts of other projects on or proximate to the base, this alternative would not significantly impact transportation.

3.2. Alternative 2 – Do Not Conduct Prescribed Burns (No Action)

Under Alternative 2, there are no anticipated impacts to land use, soils, meteorology, air quality, water resources, wetlands, threatened and endangered species, cultural resources, health and safety, noise, hazardous materials, hazardous waste, solid waste, utilities, transportation, environmental justice, or socioeconomic conditions.

3.2.1. Plant Communities

Direct and Indirect Impacts – In the short term, given that no fire would occur, there would be minimal environmental consequences of not allowing the prescribed burn. However, in the absence of fire, prairie grassland habitat surrounding the Pearson Lakes will continue to be displaced by infestations of noxious weeds, especially Canada thistle.

Cumulative Impacts – As more development occurs on the installation that creates ground disturbance, it is expected that weed infestations will continue to spread. Additionally, failure to effectively manage existing weed infestations will contribute to the spread of infestations. When combined with the impacts of other projects on or proximate to the base, this alternative could result in significant impacts to plant communities.

3.2.1.1. Noxious Weeds

Direct and Indirect Impacts – In the short term, given that no fire would occur, there would be minimal environmental consequences of not allowing the prescribed burn. However, in the absence of fire, prairie grassland habitat surrounding the Pearson Lakes will continue to be displaced by infestations of noxious weeds. In the long term, this could have significant impacts on plant communities.

Cumulative Impacts – As more development occurs on the installation that creates ground disturbance, it is expected that weed infestations will continue to spread. Additionally, failure to effectively manage existing weed infestations will contribute to the spread of infestations. When combined with the impacts of other projects on or proximate to the base, this alternative could result in significant impacts from noxious weed infestations.

3.2.2. Fish and Wildlife

Direct and Indirect Impacts – In the short term, given that no fire would occur, there would be minimal environmental consequences of not allowing the prescribed burn. However, in the absence of fire, prairie grassland habitat surrounding the Pearson Lakes will continue to be displaced by infestations of noxious weeds. The

reduction in quality forage for wildlife would cause them to emigrate to other areas of the base.

Cumulative Impacts – Due to large infestations of noxious weeds throughout the base, quality forage for wildlife in appropriate areas is becoming less available. When combined with the impacts of other projects on or proximate to the base, this alternative could significantly impact wildlife in the long-term.

4.0 LIST OF PREPARERS AND REVIEWERS

Jennifer Howenstine NEPA/Natural Resources Support F. E. Warren AFB	Tammy Notch Pollution Prevention Manager F. E. Warren AFB
Travis Beckwith NEPA & Cultural Resources Manager F. E. Warren AFB	Todd Eldridge Community Planner F. E. Warren AFB
Andy McKinley Water Quality Manager F. E. Warren AFB	John Wright Chief, Environmental Restoration F. E. Warren AFB
Kirk Schaumann Air Quality Manager F. E. Warren AFB	Ernest Cisneros Grounds Maintenance Contracting Office Representative F. E. Warren AFB
Kurt Warmbier USAF, 90 MW/JA Attorney Advisor Environmental Law	

5.0 LIST OF AGENCIES, ORGANIZATIONS, AND PERSONS TO WHOM COPIES OF THE STATEMENT ARE SENT

The following agencies/individuals were contacted and/or provided a copy of the EA during its original preparation in order to afford an opportunity for comment on the content of the document.

U. S. Fish and Wildlife Service 5353 Yellowstone Road Cheyenne WY 82001	Wyoming State Historic Preservation Office 2301 Central Avenue Cheyenne WY 82002
U.S. Army Corps of Engineers 2232 Dell Range Boulevard, Ste 210 Cheyenne WY 82009-4942	Bureau of Land Management 5353 Yellowstone Road Cheyenne WY 82001

REFERENCES

Smith Environmental, Inc. 2004. Inventory of Wetlands and Other Waters of the U.S. Within F. E. Warren Air Force Base, Laramie County, Wyoming.

USAF. 2005. F. E. Warren Air Force Base General Plan.

USAF. 2010. Installation Restoration Program Management Action Plan, F. E. Warren Air Force Base, November 2010.

USAF. 2004c. Conservation and Management Plan for Colorado Butterfly Plant and Preble's Meadow Jumping Mouse on F. E. Warren Air Force Base, June 30, 2004.

USAF. 2004d. ICBM Radiological Accident/Incident Response and Recovery Plan.

United States Natural Resources Conservation Service, 1992. Preliminary Soil Survey, F. E. Warren AFB.

U.S. Fish and Wildlife Service, National Wildlife Refuge System, Managing Invasive Plants: Concepts, Principles, and Practices

<http://www.fws.gov/invasives/staffTrainingModule/methods/burning/impacts.html>

California Invasive Plant Council, Use of Fire as a Tool for Controlling Invasive Plants
<http://www.cal-ipc.org/ip/management/fire.php>

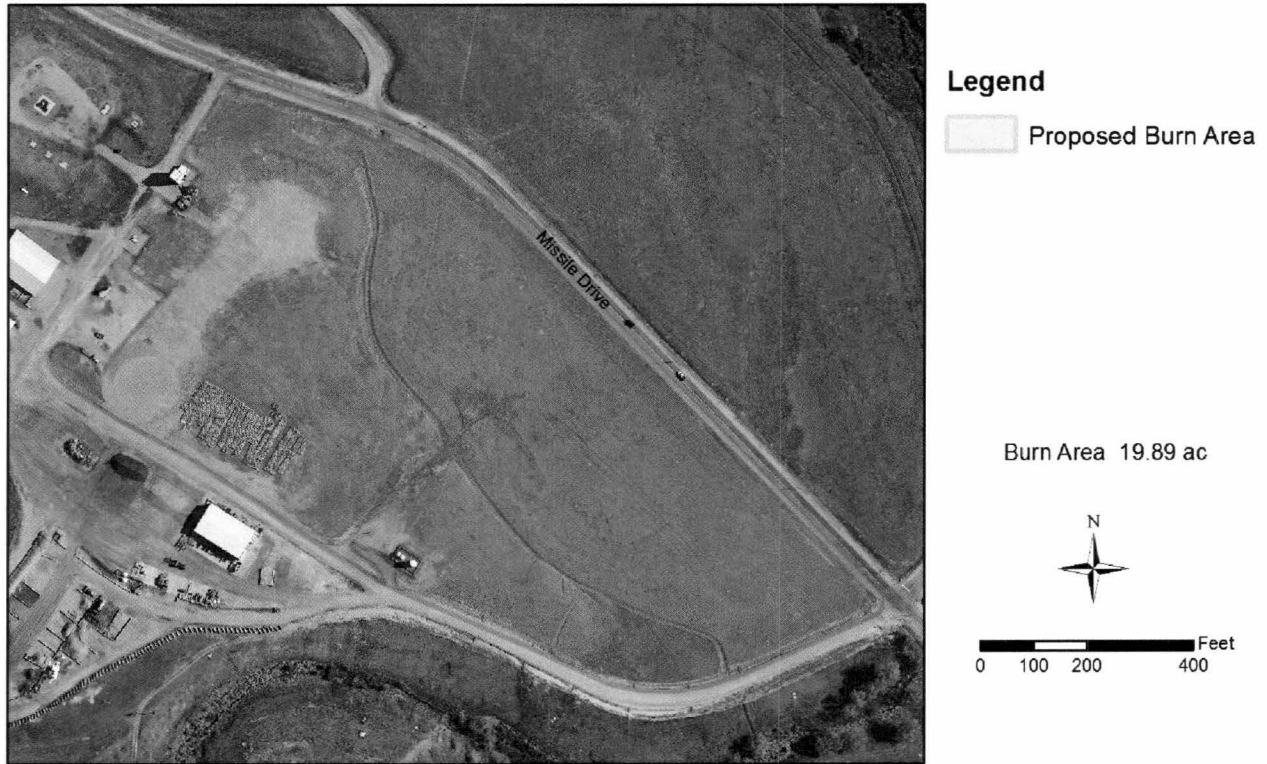
USGS, Prescribed Burning Guidelines in the Northern Great Plains
<http://www.npwrc.usgs.gov/resource/habitat/burning/index.htm>

APPENDIX A: MAPS AND FIGURES

Figure A.1. Phase I Proposed Prescribed Burn Area, North Pearson Lake



Figure A.2. Phase II Proposed Prescribed Burn Area, Fire Training Area



APPENDIX B: TERMS AND DEFINITIONS

Air Quality – A measure of the health-related and visual characteristics of the air, often derived from quantitative measurements of the concentrations of specific injurious or contaminating substances.

Cultural Resources – Any buildings, sites, districts, structures, or objects significant in history, architecture, archeology, culture, or science.

Environmental Justice – The fair treatment of people of all races, cultures, and incomes with respect to the development, adoption, implementation, and enforcement of environmental laws, regulations, and policies.

Erosion – The wearing away of the land surface by wind or water.

Natural Resources – Materials that occur in nature and are essential or useful to humans, such as water, air, land, forests, fish and wildlife, topsoil, and minerals.

Noxious Weed – A plant defined by law as being especially undesirable, troublesome, and difficult to control.

Plant Community – An assembly of plants living together.

Prescribed Burn – The deliberate use of fire under specified and controlled conditions to achieve a resource management goal.

Water Resources – Water in the landscape (above and below ground) with current or potential value to the community and the environment.

Water Quality – The chemical, physical, and biological characteristics of water with respect to its suitability for a particular purpose; the same water may be of good quality for one purpose or use, and poor for another, depending on its characteristics and the requirements for the particular use.

Wetland – An area that is regularly saturated by surface water or groundwater and is characterized by a prevalence of vegetation that is adapted for life in saturated soil conditions (e.g., swamps, bogs, fens, marshes, and estuaries).

Wildlife – All non-domesticated and semi-domesticated mammals, birds, reptiles, and amphibians living in a natural environment, including both game species and non-game species, whether considered beneficial or otherwise.

APPENDIX C: PUBLIC AND AGENCY COMMENTS

APPENDIX D: RESPONSE TO COMMENTS

APPENDIX E: AFFECTED ENVIRONMENT

General Setting

F. E. Warren AFB is located in the southeastern corner of Wyoming on the western edge of the City of Cheyenne, in Laramie County. It is approximately 11 miles north of the Colorado-Wyoming border, 100 miles north of Denver, Colorado, and 45 miles west of the Nebraska-Wyoming border.

The base encompasses 5,866 acres and is oriented in a general north-south direction. The base is bounded on the east by Interstate 25, which separates the base from high-density residential areas of Cheyenne. The base is bounded on the west by Roundtop Road, low-density residential development, and the U.S. Department of Agriculture's High Plains Grassland Research Station. The base is bounded on the north by generally open range land, and on the south by State Highway 210, low-density residential development, and open rangeland.

Soils

The predominant soil series on the base is classified texturally as loamy, with an average topsoil depth ranging from 4 to 6 inches. The subsoil is primarily alluvial clay that extends from a depth of approximately 6 to 36 inches. Refer to the U. S. Department of Agriculture, Soil Conservation Service, *F. E. Warren Air Force Base Soil Report* (1992), for additional detail.

Meteorology

F. E. Warren AFB experiences moderately warm summers and cold winters. The average annual temperature is 46° Fahrenheit (F). The average daily maximum and minimum temperatures are 83° F in July and 26° F in January. Temperature extremes range from -34° to 100° F. Prevailing winds are from the northwest to west throughout the year, with secondary peaks in wind frequency from the south to north, spring through autumn. The annual average wind speed is 13.7 miles per hour. Annual average precipitation is about 14 inches. Winter is the driest season, with average monthly precipitation of less than one inch. Late spring and early summer are the wettest times of the year, with just over two inches average monthly precipitation (USAF, 2004a).

Air Quality

Under provisions of the Clean Air Act, which is intended to improve the quality of the air we breathe, the Environmental Protection Agency (EPA) sets limits on how much of a pollutant can be in the air anywhere in the United States. This ensures that all Americans have the same basic health and environmental protections. The law allows individual states to have stronger pollution controls, but states are not allowed to have weaker pollution controls than those set for the whole country. The EPA calls these

pollutants "criteria air pollutants" because the agency has regulated them by first developing health-based criteria (science-based guidelines) as the basis for setting permissible levels. One set of limits (primary standard) protects health; another set of limits (secondary standard) is intended to prevent environmental and property damage. A geographic area that meets or does better than the primary standard is called an attainment area; areas that do not meet the primary standard are called non-attainment areas. Laramie County is designated as an attainment area for all criteria air pollutants.

Water Resources

The installation is located within the Crow Creek Watershed, which is part of the South Platte River Basin. Perennial surface water resources located on the base include Crow Creek, Diamond Creek, North and South Pearson Lakes, and Lake Centennial.

North and South Pearson Lakes consist of two reservoirs connected by a culvert. Surface water area for North Pearson Lake is estimated at 12.6 acres, while South Pearson Lake is estimated to at 10.6 acres (Smith Environmental 2004).

Depth to groundwater on the installation is variable but generally exceeds 5 feet.

Wetlands

Wetlands comprise approximately 64.7 acres of F. E. Warren AFB (approximately 62.3 acres of which are jurisdictional). There are four types of wetlands on the base: open water, palustrine emergent, palustrine shrub-scrub, and palustrine forested wetlands. Most wetlands on the base are associated with riparian areas and the Pearson Lakes. Jurisdictional Waters of the U.S. and Wetlands are under the regulatory authority of the U.S. Army Corps of Engineers (USACE).

Plant Communities

Three primary vegetation communities occur on the base: (1) shortgrass prairie grassland; (2) wet (mesic) meadow wetlands; and (3) riparian areas – cottonwood and willow. The shortgrass prairie grassland is dominated by blue grama (*Bouteloua gracilis*), western wheatgrass (*Elymus smithii*), needle-and-thread grass (*Stipa comata*), and fringed sagewort (*Artemisia frigida*). Much of the previously disturbed and reclaimed areas on the base (e.g., small arms impact area) are dominated by crested wheatgrass (*Agropyron cristatum*), which was planted as part of restoration efforts (WEST 2001b). Plains cottonwood, Colorado spruce, Ponderosa pine, and green ash are the most important woody vegetation species on the installation. There are no wooded areas of five acres or greater on the base.

Noxious Weeds

Several noxious weed species are known to occur on F. E. Warren AFB. Noxious weeds are invasive, non-native plants that spread rapidly and cause considerable

damage to natural environments. Noxious weeds are defined as those species requiring control in accordance with the Federal Noxious Weed Act. Of these species, Canada thistle (*Cirsium arvense*), Dalmatian toadflax (*Linaria dalmatica*), Leafy spurge (*Euphorbia esula*), and Common hound's tongue (*Cynoglossum officinale*) are the most prevalent noxious weeds found at F. E. Warren AFB.

Fish and Wildlife

Fish species that have been stocked in the Pearson Lakes include brown trout, rainbow trout, lake trout, catfish, perch, and fathead minnow.

Aquatic furbearers on the base include beaver and muskrat. Beavers are found along Crow Creek where woody plant species such as cottonwoods and willow serve as food sources. Muskrats also utilize the aquatic habitats of both Crow and Diamond Creeks, and the Pearson Reservoirs (Rosenlund 1992).

Wildlife on the installation includes pronghorn (*Antilocapra americana*), mule deer (*Odocoileus hemionus hemionus*), white-tailed deer (*Odocoileus virginianus*), badger (*Taxidea taxus*), raccoon (*Procyon lotor hirtus*), porcupine (*Erethizon dorsatum*), red fox (*Vulpes vulpes*), coyote (*Canus latrans*), and Wyoming ground squirrel (*Spermophilus elegans*).

At least 139 species of birds have been recorded on the base. Included among the several species of waterfowl are the tundra swan (*Cygnus columbianus*), Canada goose (*Branta canadensis*), and wood duck (*Aix sponsa*). The birds-of-prey recorded on the base include the turkey vulture (*Cathartes aura*), bald eagle (*Haliaeetus leucocephalus*), peregrine falcon (*Falco peregrinus*), and several species of hawk (*Buteo spp.*) (WEST 2001b).

Cultural and Archeological Resources

F. E. Warren AFB, with a history extending over 130 years, is the oldest continually active military installation in the Air Force. Beginning as a military post in July 1867 when it was known as Fort D. A. Russell, the early mission of the facility was to protect the Union Pacific Railroad crews involved in the extension of the railroad. Today, one-third of the Minuteman ICBM force is based at F. E. Warren AFB. The base has approximately 220 brick structures listed in the National Register of Historic Places. Most of these facilities are located within the central core of the base, designated as a Historic District in 1969 under the provisions of the National Historic Preservation Act, and designated the Fort D. A. Russell National Historic Landmark in 1972.

The prehistoric peoples who lived in the area now occupied by F. E. Warren AFB left numerous remains and sites across the landscape that show where and how they lived. Because the base has been shielded from public development by the presence of a military installation since 1867, many of the sites have been saved from destruction. To date, approximately 200 archeological sites have been identified on F. E. Warren AFB,

71 of which are eligible or potentially eligible for inclusion in the National Register of Historic Places. No traditional cultural properties or sacred sites have been identified. Records on file at F. E. Warren AFB indicate that close to 95 percent of the base has been surveyed for archeological resources. Numerous laws, regulations, policies and guidelines apply to the archeological resources found on F. E. Warren AFB.

Health and Safety

Portions of the northern half of the base have historically been used for firing range activities, occupying an estimated 3,000 acres. Weapons historically fired at this range include small arms, cannons, and anti-tank weapons. Almost the entire historic range is now closed with the only remaining areas still used being the baffled small arms range and an Explosive Ordnance Disposal (EOD) training area (USAF 2004b).

Utilities

The Cheyenne Board of Public Utilities (BOPU) provides base water and wastewater treatment services (USAF 2004a). The Cheyenne BOPU treats all wastewater discharged by F. E. Warren AFB directly into the city's sanitary sewer system at one of two treatment plants. Western Area Power Authority and Rocky Mountain Generation Cooperative provide electrical power to the base. Natural gas is supplied to the installation by Cheyenne Light, Fuel, and Power.

Transportation

F. E. Warren AFB has excellent access to the regional transportation network of highways. The base can be accessed via three entry control points: 1) Gate 1 on Randall Avenue, 2) Gate 2 on Missile Drive, and 3) Gate 5 on Central Avenue. All three access routes intersect Interstate 25. Traffic congestion normally peaks in the early morning, at noon, and at the end of the workday.